

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

CLAIMS:

1. (Original) A face recognition and/or verification system including the step of registering a persons actual face wherein an image of said actual face is captured and synthesized to create a plurality of face prototypes, wherein said face prototypes are stored for later analysis and comparison with a captured image to be recognised or verified, and wherein at least one of translational, rotational and scalar transformations is applied to the captured actual face image for normalization thereof.
2. (Original) The system as claimed in claim 1 wherein said face prototypes represent possible appearances of said actual face under various lighting conditions, varying facial expressions, varying facial orientations, and/or modeling errors.
3. (Original) The system as claimed in claim 1, wherein comparison of said face prototypes and captured image uses a face matching algorithm.
4. (Original) The system as claimed in claim 1, wherein comparison of said face prototypes and captured image uses face templates or feature vectors.
5. (Currently Amended) The system as claimed in ~~any preceeding~~ claim 1, wherein synthesizing of said actual face includes normalising said actual face image based on the spatial relationship between at least two features of the actual face image.
6. (Original) The system as claimed in claim 5, wherein normalising includes rotating said actual face image to bring eyes of said actual face image to a horizontal plane.

7. (Currently Amended) The system as claimed in claim 5 ~~or claim 6~~, wherein normalising includes scaling said actual face image such that the eyes are a fixed distance apart.
8. (Original) The system as claimed in claim 7, wherein said eyes are fixed at 50 pixels apart.
9. (Currently Amended) The system as claimed in ~~any preceding~~ claim 1, wherein the area above the person's eyebrows and below the person's mouth is not synthesized.
10. (Currently Amended) The system as claimed in ~~any preceding~~ claim 1, wherein synthesizing of said actual face includes determining alternative positions for each eye so as to compensate for possible errors.
11. (Original) The system as claimed in claim 10, wherein five alternative positions are determined for each eye.
12. (Currently Amended) The system as claimed in ~~any preceding~~ claim 1, wherein synthesizing of said actual face includes applying at least one predefined lighting mask to said actual face image.
13. (Original) The system as claimed in claim 12, wherein three to 16 predefined lighting masks are used.
14. (Currently Amended) The system as claimed in ~~any preceding~~ claim 1, wherein synthesizing of said actual face includes applying at least one predefined warping mark to said actual face image.
15. (Original) The system as claimed in claim 14, wherein 25 predefined warping marks are used.

16. (Currently Amended) The system as claimed in claim 12 ~~or claim 13~~, wherein said at least one lighting mask includes photometric transform.

17. (Currently Amended) The system as claimed in claim 14 ~~or claim 15~~, wherein said at least one warping mask includes geometric transform.

18. (Original) The system as claimed in claim 17, wherein said geometric transform is estimated using optical flow estimation.

19. (Original) The system as claimed in claim 16, wherein said photometric transform includes at least one of:

algorithmic function, exponential stretch, vertical shadow, horizontal shadow and differentiating image.

20. (Original) A facial prototype synthesis system wherein an image of a persons actual face is initially normalized by applying at least one of translational, rotational and scalar transformations thereto for subsequently creating a plurality of face prototypes, said face prototypes representing possible appearances of said actual face under various lighting conditions, varying facial expressions, varying facial orientations, and/or modeling errors, and wherein said face prototypes are stored for later use

21. (Original) The system as claimed in claim 20, wherein said actual face image is normalized prior to creating said face prototypes based on the spatial relationship between at least two features of the actual face image.

22. (Original) The system as claimed in claim 21, wherein normalising includes rotating said actual face image to bring eyes of said actual face image to a horizontal plane.

23. (Currently Amended) The system as claimed in claim 21 ~~or claim 22~~, wherein normalising includes scaling said actual face image such that the eyes are a fixed distance apart.

24. (Original) The system as claimed in claim 23, wherein said eyes are fixed at 50 pixels apart.

25. (Currently Amended) The system as claimed in ~~any one of claims 20 to 24~~ claim 20, wherein the area above the persons eyebrows and below the persons mouth is not synthesized.

26. (Currently Amended) The system as claimed in ~~any one of claims 20 to 25~~ claim 20, wherein to create said face prototypes said system determines alternative positions for each eye so as to compensate for possible errors.

27. (Original) The system as claimed in claim 26, wherein five alternative positions are determined for each eye.

28. (Currently Amended) The system as claimed in ~~any one of claims 20 to 27~~ claim 20 wherein to create said face prototypes said system applies at least one predefined lighting mask to said actual face image.

29. (Original) The system as claimed in claim 28, wherein three to 16 predefined lighting masks are used.

30. (Currently Amended) The system as claimed in ~~any one of claims 20 to 29~~ claim 20 wherein to create said face prototypes said system applies at least one predefined warping mask to said actual face image.

31. (Original) The system as claimed in claim 30, wherein 25 predefined warping masks are used.

32. (Currently Amended) The system as claimed in claim 28 ~~or claim 29~~, wherein said at least one lighting mask includes photometric transform.

33. (Currently Amended) The system as claimed in claim 30 ~~or claim 31~~, wherein said at least one warping mask includes geometric transform.

34. (Original) The system as claimed in claim 33, wherein said geometric transform is estimated using optical flow estimation.

35. (Original) The system as claimed in claim 32, wherein said photometric transform includes at least one of:

algorithmic function, exponential stretch, vertical shadow, horizontal shadow and differentiating image.

36. (Original) The system as claimed in claim 20, wherein said face prototypes are generated by applying photometric and/or geometric transforms to said image.

37. (Original) A facial prototype synthesis system wherein an image of a persons actual face is normalised by applying at least one of translational, rotational and scalar transformations to the captured actual face image, and synthesized by determining possible alternative eye positions and applying at least one mask to said image to create a plurality of face prototypes, and wherein said face prototypes represent possible appearances of said actual face under various lighting conditions, varying facial expressions, varying facial orientations, and/or modeling errors.